CLAIMS

1. A specific regulator of Ii protein expression or immunoregulatory function, the oligonucleotide CTCGGTACCTACTGG being specifically excluded.

2. The specific regulator of Claim 1 which functions through the formation of a duplex molecule with an RNA molecule encoding mammalian Ii protein, the formation of the duplex molecule functioning to inhibit Ii protein synthesis at the translation level.

3. The specific regulator of Claim 2 comprising a copolymer comprised of nucleotide bases being characterized by the ability to hybridize specifically to the RNA molecule encoding mammalian Ii protein.

4. The specific regulator of Claim 2 comprising a DNA molecule which encodes a first RNA molecule which is complementary to a segment of a second RNA molecule which encodes a mammalian Ii protein, the first RNA molecule having the ability to hybridize with the second RNA molecule thereby inhibiting translation of the second RNA molecule.

5. The specific regulator of Claim 3 wherein the nucleotide bases are joined to a backbone which includes moieties selected from the group consisting of phosphodiester, phosphorothioate, alkylphosphonate, phosphoramidate, phosphotriester, 2'-deoxyribose, 2'-O-alkyl ribose, 2'O-alkenyl ribose, 2'-O-substituted alkyl ribose, morpholine, an amide linkage, and homologs.

6. The specific regulator of Claim 5 wherein the nucleotide bases are selected from the group consisting of adenine, cytosine, guanine, thymine, uracil, 2,6-diaminopurine, 5-propynyl uracil, 5-propynyl cytosine and homologs.

7. The specific regulator of Claim 6 comprising a nucleotide base sequence complementary to the translation initiation site of the RNA molecule encoding mammalian Ii protein.

8. The specific regulator of Claim 7 comprising the nucleotide base sequence of SEQ ID NO: 54.

9. The specific regulator of Claim 7 comprising the nucleotide base sequence of SEQ ID NO: 53.

10. The specific regulator of Claim 7 comprising the nucleotide base sequence of SEQ ID NO: 52.

11. The specific regulator of Claim 7 comprising the nucleotide base sequence of SEQ ID NO: 40.

12. The specific regulator of Claim 7 comprising the nucleotide base sequence of SEQ ID NO: 55.

13. The specific regulator of Claim 6 comprising a nucleotide base sequence which is complementary to a portion of exons bounding a splice site of the RNA molecule.

14. The specific regulator of Claim 13 comprising the nucleotide base sequence of SEQ ID NO: 32.

15. The specific regulator of Claim 13 comprising the nucleotide base sequence of SEQ ID NO: 62.

16. The specific regulator of Claim 6 which inhibits intron splicing of the RNA molecule.

17. The specific regulator of Claim 16 which is complementary to a portion of the 3' end of the first exon and a portion of the 5' end of the first intron of the RNA molecule.

18. The specific regulator of Claim 6 which is complementary to a region 3' of the termination codon of the RNA molecule.

19. The specific regulator of Claim 18 comprising the nucleotide base sequence of SEQ ID NO: 64.

20. The specific regulator of Claim 6 which is complementary to a region 5' of the initiation codon of the RNA molecule.

21. The specific regulator of Claim 20 comprising the nucleotide base sequence of SEQ ID NO: 48.

22. The specific regulator of Claim 6 which is complementary to a region encoding the CLIP peptides.

23. The specific regulator of Claim 22 comprising the nucleotide base sequence of SEQ ID NO: 11.

24. The specific regulator of Claim 6 which is conjugated at terminal or internal sites to one or more chemical groups which cross-link the specific regulator to the hybridized RNA molecule.

25. The specific regulator of Claim 24 wherein the chemical group is an alkylating group.

26. The specific regulator of Claim 6 which is conjugated to a chemical group which catalyzes cleavage of the hybridized RNA molecule.

27. The specific regulator of Claim 26 wherein the chemical group is a chelating agent.

28. The specific regulator of Claim 6 which is a ribozyme designed to cleave the RNA molecule.

29. The specific regulator of Claim 6 which is conjugated to a chemical group which intercalates into the nucleotide bases of the RNA molecule encoding mammalian Ii protein to stabilize hybridization.

30. The specific regulator of Claim 6 which is conjugated to a chemical moiety which enhances cellular uptake.

31. The specific regulator of Claim 6 which is conjugated to a chemical moiety which directs uptake by a specific cell type.

32. The specific regulator of Claim 6 which is conjugated to a chemical moiety which improves the pharmacological properties or toxicity profile.

33. The specific regulator of Claim 4 wherein the DNA molecule is a cDNA molecule.

34. The specific regulator of Claim 33 comprising the nucleotide base sequence of SEQ ID: 68.

35. The specific regulator of Claim 33 comprising the nucleotide base sequence of SEQ ID: 71.

36. The specific regulator of Claim 33 comprising the nucleotide base sequence of SEQ ID: 72.

37. The specific regulator of Claim 33 comprising the nucleotide base sequence of SEQ ID: 75.

38. The specific regulator of Claim 33 comprising the nucleotide base sequence of SEQ ID: 77.

39. The specific regulator of Claim 33 comprising the nucleotide base sequence of SEQ ID: 78.

40. The specific regulator of Claim 33 comprising the nucleotide base sequence of SEQ ID: 79.

41. The specific regulator of Claim 4 which is expressed from a viral expression vector.

42. The specific regulator of Claim 41 wherein the viral expression vector is characterized by the ability to enhance transfection into mammalian cells.

43. The specific regulator of Claim 1 comprising a copolymer comprised of nucleotide bases, being characterized by the ability to hybridize specifically to a gene encoding mammalian Ii protein.

44. The specific regulator of Claim 1 comprising an organic molecule of 20 to 1000 Daltons.

45. A specific regulator of Claim 1 which is formulated in a pharmaceutically acceptable carrier.

46. The specific regulator Claim 45 wherein the pharmaceutically acceptable carrier enhances delivery of the specific regulator of Ii to a population of cells.

47. The specific regulator of Claim 46 wherein the pharmaceutically acceptable carrier is a liposome.

48. The specific regulator of Claim 45 wherein the pharmaceutically acceptable carrier enhances delivery of the regulator of Ii expression to specific cell populations.

49. The specific regulator of Claim 48 wherein the pharmaceutically acceptable carrier is a liposome with an attached molecule which enhances delivery to the specific cell population.

50. A MHC class II-positive antigen presenting cell containing a specific regulator of Ii expression, the oligonucleotide CTCGGTACCTACTGG being specifically excluded.

51. The MHC class II-positive antigen presenting cell of Claim 50 wherein the specific regulator of Ii expression functions through the formation of a duplex molecule with an RNA molecule encoding mammalian Ii protein, the formation of the duplex molecule functioning to inhibit protein Ii synthesis at the translation level.

52. The MHC class II-positive antigen presenting cell of Claim 51 wherein the specific regulator of Ii expression is a copolymer comprised of nucleotide

bases, being characterized by the ability to hybridize specifically to the RNA molecule.

53. The MHC class II-positive antigen presenting cell of Claim 51 wherein the specific regulator of Ii expression is an expressible reverse gene construct, comprising a DNA molecule which encodes a first RNA molecule which is complementary to a segment of a second RNA molecule which encodes a mammalian Ii protein, the first RNA molecule having the ability to hybridize with the second RNA molecule thereby inhibiting translation of the second RNA molecule.

54. The MHC class II-positive antigen presenting cell of Claim 50 which is a malignant cell.

55. The MHC class II-positive antigen presenting cell of Claim 50 which is a non-malignant cell.

56. A method for displaying an autodeterminant peptide, in association with a MHC class II protein, on the surface of a MHC class II-positive antigen presenting cell, comprising:

a) providing the MHC class II-positive antigen presenting cell; and

b) introducing into the MHC class II-positive antigen presenting cell, a specific regulator of Ii protein expression or immunoregulatory function.

57. The method of Claim 56 wherein the specific regulator of Ii is introduced into the MHC class II-positive antigen presenting cell via electroporation.

58. The method of Claim 56 wherein the specific regulator of Ii functions through the formation of a duplex

molecule with an RNA molecule encoding mammalian Ii protein, the formation of the duplex molecule functioning to inhibit Ii protein synthesis at the translation level.

59. The method of Claim 58 wherein the specific regulator of Ii is a copolymer comprising nucleotide bases.

60. The method of Claim 56 wherein the specific regulator of Ii expression is an expressible reverse gene construct, comprising a DNA molecule which encodes a first RNA molecule which is complementary to a segment of a second RNA molecule which encodes a mammalian Ii protein, the first RNA molecule having the ability to hybridize with the second RNA molecule thereby inhibiting translation of the second RNA molecule.

61. A therapeutic method for treating a malignancy in a patient by enhancing immunological attack on the malignancy, comprising:

a) providing a population of malignant cells and, if necessary, inducing expression of MHC class II molecules;

b) introducing into the MHC class II-expressing malignant cells of step a), a specific regulator of Ii protein expression to enhance presentation of endogenous antigenic determinants; and

c) introducing the cells produced by step b) into the patient.

62. The therapeutic method of Claim 61 wherein the cells produced by step b) are made replication incompetent prior to step c).

63. The therapeutic method of Claim 61 wherein the specific regulator of Ii protein expression is introduced into the MHC class II-expressing malignant cells via electroporation.

64. The therapeutic method of Claim 61 wherein the specific regulator of Ii protein expression functions through the formation of a duplex molecule with an RNA molecule encoding mammalian Ii protein, the formation of the duplex molecule functioning to inhibit Ii protein synthesis at the translation level.

65. The therapeutic method of Claim 64 wherein the specific regulator of Ii protein expression is a copolymer comprised of nucleotide bases.

66. The therapeutic method of Claim 61 wherein the specific regulator of Ii protein expression is an expressible reverse gene construct, comprising a DNA molecule which encodes a first RNA molecule which is complementary to a segment of a second RNA molecule which encodes a mammalian Ii protein, the first RNA molecule having the ability to hybridize with the second RNA molecule thereby inhibiting translation of the second RNA molecule.

67. The therapeutic method of Claim 61 wherein the population of malignant cells of step a) is obtained from the patient.

68. A therapeutic method for treating a malignancy in a patient by enhancing immunological attack on the malignancy, comprising:

a) providing a population of cells either expressing or containing antigenic determinants of the

malignancy and, if necessary, inducing expression of MHC class II molecules;

b) introducing into the MHC class II-expressing cells of step a) a specific regulator of Ii protein expression to enhance presentation of endogenous antigenic determinants; and

c) introducing the cells produced by step b) or a derivative thereof, into the patient.

69. The therapeutic method of Claim 68 wherein the cells produced by step b) are made replication incompetent prior to step c).

70. The therapeutic method of Claim 68 wherein the specific regulator of Ii protein expression is introduced into the MHC class II-expressing cells via electroporation.

71. The therapeutic method of Claim 68 wherein the specific regulator of Ii protein expression functions through the formation of a duplex molecule with an RNA molecule encoding mammalian Ii protein, the formation of the duplex molecule functioning to inhibit Ii protein synthesis at the translation level.

72. The therapeutic method of Claim 71 wherein the specific regulator of Ii protein expression is a copolymer comprised of nucleotide bases.

73. The therapeutic method of Claim 68 wherein the specific regulator of Ii protein expression is an expressible reverse gene construct, comprising a DNA molecule which encodes a first RNA molecule which is complementary to a segment of a second RNA molecule which encodes a mammalian Ii protein, the first RNA molecule having the ability to hybridize with the second RNA molecule

thereby inhibiting translation of the second RNA molecule.

74. The therapeutic method of Claim 68 wherein the population of cells of step a) is obtained from the patient.

75. A therapeutic method for treating a malignancy in a patient comprising administering to the patient a specific regulator of Ii protein expression or immunoregulatory function in an amount sufficient to induce an anti-cancer immune response.

76. The therapeutic method of Claim 75 wherein the administered amount is between 10 $\mu$g and 100 mg daily.

77. The therapeutic method of Claim 75 wherein the mode of administration is selected from the group consisting of intravenous infusion, infusion into a body cavity, absorption across skin, absorption across a mucosal surface, and absorption across the gastrointestinal tract.

78. The therapeutic method of Claim 75 wherein the specific regulator of Ii protein expression or immunoregulatory function is administered with a pharmaceutically acceptable carrier.

79. A therapeutic method for treating a nonmalignant condition in an individual by enhancing immunological attack on an undesired cell population of the individual, the method comprising:

a) providing cells from the undesired cell population and, if necessary, inducing expression of MHC class II molecules;

b) introducing into the MHC class II-expressing cells of step a) a specific regulator of Ii protein expression to enhance MHC CLASS II presentation of antigenic determinants; and

c) re-introducing the cells produced by step b) into the individual.

80. The therapeutic method of Claim 79 wherein the cells produced by step b) are made replication incompetent prior to step c).

81. The therapeutic method of Claim 79 wherein the specific regulator of Ii protein expression is introduced into the MHC class II-expressing cells via electroporation.

82. The therapeutic method of Claim 79 wherein the undesired cell population comprises autoreactive T lymphocytes which are associated with an autoimmune disorder.

83. The therapeutic method of Claim 79 wherein the undesired cell population comprises virus-infected cells.

84. A therapeutic method for treating an autoimmune disease in a patient comprising administering to the patient a specific regulator of Ii protein expression or immunoregulatory function in an amount sufficient to induce an anti-disease immune response.

85. The therapeutic method of Claim 84 wherein the administered amount is between 10 $\mu$g and 100 mg daily.

86. The therapeutic method of Claim 84 wherein the mode of administration is selected from the group consisting of

intravenous infusion, infusion into a body cavity, absorption across skin, absorption across a mucosal surface, and absorption across the gastrointestinal tract.

87. The therapeutic method of Claim 84 wherein the specific regulator of Ii protein expression or immunoregulatory function is administered with a pharmaceutically acceptable carrier.

88. A method for isolating an autodeterminant peptide from a cell comprising:
    a) providing the cell and, if necessary, inducing expression of MHC class II molecules;
    b) introducing into the MHC class II-expressing cell, a specific regulator of Ii protein expression;
    c) solubilizing the MHC class II-expressing cell produced by step b);
    d) purifying MHC class II molecules and associated autodeterminant peptides from the solubilized cell of step c); and
    e) isolating the autodeterminant peptides from the MHC class II molecules of step d).

89. The method of Claim 88 wherein the specific regulator of Ii protein is introduced into the MHC class II-expressing cell via electroporation.

90. The method of Claim 88 wherein the specific regulator of Ii protein expression is a copolymer comprised of nucleotide bases, being characterized by the ability to hybridize specifically to an RNA molecule encoding mammalian Ii protein, thereby inhibiting Ii expression.

91. A therapeutic method for treating a pathogenic autoimmune response in a patient comprising:
    a) providing a cell from the patient, and if necessary, inducing expression of MHC class II molecules;
    b) introducing into the MHC class II-expressing cell, a specific regulator of Ii protein expression;
    c) solubilizing the MHC class II-expressing cell produced by step b);
    d) purifying MHC class II molecules and associated autodeterminant peptides from the solubilized cell of step c); and
    e) isolating the autodeterminant peptides from the MHC class II molecules of step d); and
    f) introducing synthetic preparations of the autodeterminant peptides of step e) into the patient to effect a clinical alteration.

92. The therapeutic method of Claim 91 wherein the specific regulator of Ii protein is introduced into the MHC class II-expressing cell via electroporation.

93. The therapeutic method of Claim 91 wherein the cell is a T lymphocyte which expresses T cell receptors which are active in the pathological process.

94. The therapeutic method of Claim 91 wherein the cell is a target cell of the pathogenic autoimmune response.

95. The therapeutic method of Claim 91 wherein the cell is infected with a virus.

96. A therapeutic method for treating a tissue-specific autoimmune disorder in an individual at risk by

increasing Ii expression in tissue likely to provoke an autoimmune reaction in the individual, comprising:

a) providing an expression construct comprising an Ii gene under the control of a promoter which is active in cells of the tissue; and

b) introducing the expression construct into the cells of the tissue in the individual prior to disease onset.